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CATALOGUE

Welch protein purification catalogue

Welch

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Welch Materials

PROTEIN PURIFICATION
PRODUCT MANUAL



Innovative / Reproducible
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Welch Materials, Inc.

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FYZL-109

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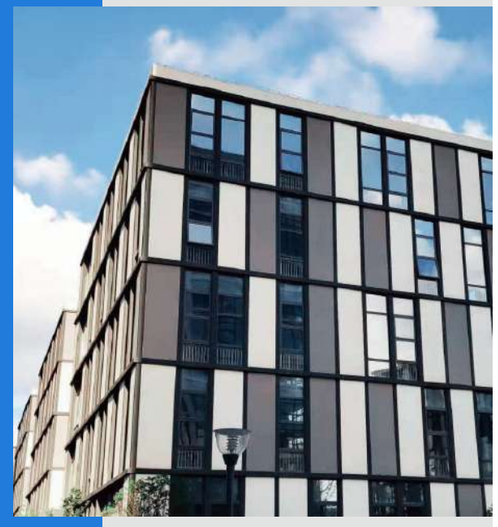
COMPANY PROFILE

Welch Materials is a multinational company that develops and manufactures laboratory consumables including analytical and preparative HPLC columns, Solid Phase Extraction (SPE) columns, GC columns, bulk packing materials, protein purification products and other consumables.

Welch Materials (Shanghai), Inc. was established in 2003 at Shanghai, China and Welch Materials (Zhejiang), Inc. was opened in 2011 at Jinhua, Zhejiang, China. We also have set Welch Materials, Inc. at West Haven, CT, USA and Welch Materials India Pvt., Ltd. at Gurgaon, India.

To meet customer's requirements, Welch introduces the lab biological consumables product lines such as pipette filter tips, centrifuge tube, transfer pipette, cryovial tube, nasal swab, collection tube, urine cup, pcr tube, pcr plate and other plastic products.

For more infomation about lab consumables, please visit our website: www.welchlab.com.



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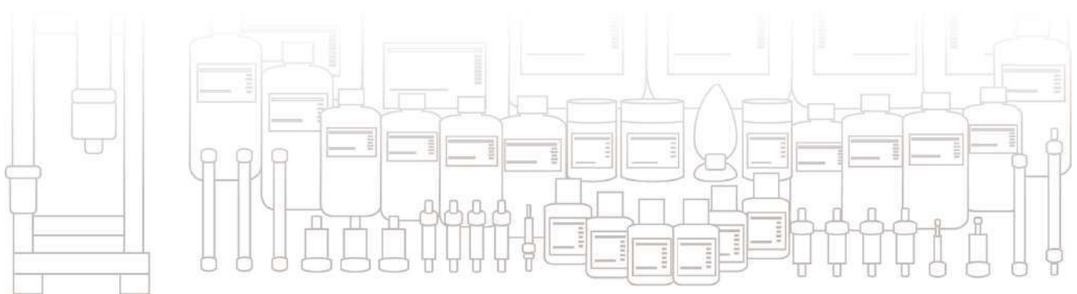
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Catalog

Common Abbreviations in This Manual

Abbreviation	Full spelling	Meaning
FF	Fast Flow	Fast flow rate resin, average particle size approx. 90 μm
HP	High Performance	High resolution resin, average particle size approx. 34 μm
Fine	Fine	Average particle size approx. 40 μm
BB	Big Beads	Large particle resin, average particle size approx. 200 μm
XL	Extreme Load	High loading capacity
WA	Welch Agarose	Agarose-based matrix
WD	Welch Dextran	Dextran-based matrix
WP	Welch Polymer	Polymer-based matrix
WH	Welch Hard	High-rigidity agarose matrix, pressure resistant up to 5 bar
WI	Welch Inorganic	Inorganic matrix such as silica gel or hydroxyapatite
WK-Col	Welch Column	Pre-packed column
WK-EC	Welch Empty Column	Empty column



01 Gel Filtration Chromatography (GFC/SEC)

Principles of GFC



Gel filtration chromatography (GFC) separates biomolecules based on differences in size and shape. The media consists of porous beads. Large molecules cannot enter the internal pores and elute quickly with the void volume, resulting in a shorter retention time. Smaller molecules penetrate the pores and elute later, as they spend more time within the matrix. Effective separation depends on choosing media with suitable pore sizes according to the molecular weight of the target substances.

Choosing Gel Filtration Resin-Based on Separation Purpose

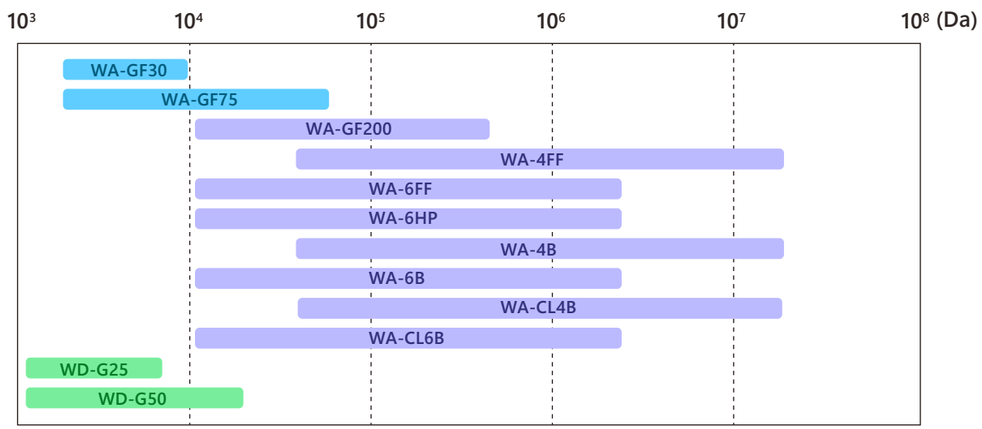
- **Group Separation**

  This involves classifying sample components into high and low molecular weight groups. It is commonly used for desalting and buffer exchange. Example: WD-G25 series.

- **Fine Separation**

  This aims to separate components with similar molecular weights and is used in analytical or fine purification stages. Example: WA-FF and WA-GF series.

Separation Range of Gel Filtration Media (for Globular Proteins)



Agarose-Based Gel Filtration Resins

WA-4B/6B

WA-4B and WA-6B are made from 4% and 6% agarose respectively, processed through emulsification, washing, and sieving. Suitable for separation and purification or analysis of polysaccharides, nucleic acids, viruses, and other large biomolecules. The gel structure is stabilized by hydrogen bonding, making the matrix soft and poorly pressure-resistant, and not suitable for autoclaving.



WA-CL 4B/6B

WA-CL 4B and WA-CL 6B are cross-linked forms of WA-4B and WA-6B using bifunctional agents. They exhibit significantly improved physical and chemical stability and can withstand autoclaving at 121 °C. Suitable for large biomolecules such as polysaccharides, nucleic acids, and viruses.

Basic parameters

Resin name	Separation range (kDa)		Average particle size (μm)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
	Spherical molecule	Linear molecule						
WA-4B	60~20000	30~5000	90	0.018	15 (WK-EC26/40, h=30cm)	4~9 (work) 4~9 (CIP)	200mL	W1001
							1L	W1002
							5L	W1003
							10L	W1004
							20L	W1005
WA-6B	10~4000	10~1000	90	0.02	20 (WK-EC26/40, h=30cm)	4~9 (work) 4~9 (CIP)	200mL	W1006
							1L	W1007
							5L	W1008
							10L	W1009
							20L	W1010
WA-CL 4B	60~20000	30~5000	90	0.025	25 (WK-EC26/40, h=30cm)	3~13 (work) 3~14 (CIP)	200mL	W1011
							1L	W1012
							5L	W1013
							10L	W1014
							20L	W1015
WA-CL 6B	10~4000	10~1000	90	0.045	30 (WK-EC26/40, h=30cm)	3~13 (work) 3~14 (CIP)	200mL	W1016
							1L	W1017
							5L	W1018
							10L	W1019
							20L	W1020

WA-4FF/6FF

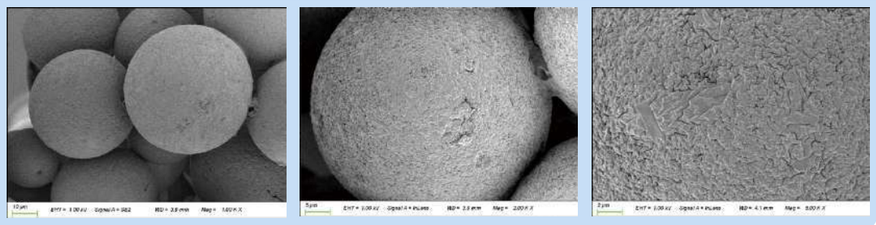
WA-4FF and WA-6FF are more extensively cross-linked than WA-CL variants. They offer superior chemical and physical stability, fast flow rates, and autoclave tolerance at 121°C. Suitable for large-scale purification of biomolecules like polysaccharides, nucleic acids, and viruses. They are also usable as base matrices for affinity, hydrophobic interaction, and ion exchange chromatography.



WA-6 HP

WA-6 HP is composed of 34 µm agarose beads subjected to multiple cross-linking steps, providing enhanced stability. It supports high flow rates and is ideal for high-resolution, large-scale purification of large biomolecules. It is also commonly used as a high-performance base matrix for affinity, hydrophobic interaction, and ion exchange chromatography.

Electron micrographs of WA-6FF



Basic parameters

Resin name	Separation range (kDa)		Average particle size (µm)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
	Spherical molecule	Linear molecule						
WA-4FF	60~20000	30~5000	90	0.3	90 (WK-EC50/100, h=80cm)	2~12 (work) 2~14 (CIP)	200mL	W1021
							1L	W1022
							5L	W1023
							10L	W1024
							20L	W1025
WA-6FF	10~4000	10~1000	90	0.3	110 (WK-EC50/100, h=80cm)	2~12 (work) 2~14 (CIP)	200mL	W1027
							1L	W1028
							5L	W1029
							10L	W1030
							20L	W1031
WA-6 HP	10~4000	10~1000	34	0.3	30~60 (WK-EC50/100, h=80cm)	2~12 (work) 2~14 (CIP)	200mL	W1032
							1L	W1034
							5L	W1035

WA-GF 30/75/200

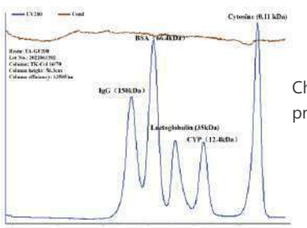
WA-GF Series are based on highly cross-linked agarose and filled with cross-linked dextran, combining dextran's high selectivity with agarose's physical robustness. They provide high resolution, mechanical strength, flow rates, minimal bed height variation under buffer concentration changes, and low nonspecific adsorption. High recovery and scalability make them ideal for fine purification.



Basic parameters

Resin name	Separation range (kDa)		Average particle size (μm)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Applications	Spec.	P/N
	Spherical molecule	Linear molecule							
WA-GF30	<10	0.4~7	34	0.3	30~60 (WK-EC26/100, h=80cm)	3~12 (work) 1~14 (CIP)	Recombinant proteins, peptides, polysaccharides, small proteins	200mL	W1039
								1L	W1040
								5L	W1041
								10L	W1042
								20L	W1043
WA-GF75	3~70	0.5~30	34	0.3	30~60 (WK-EC26/100, h=80cm)	3~12 (work) 1~14 (CIP)	Recombinant proteins, cytochromes	200mL	W1044
								1L	W1045
								5L	W1046
								10L	W1047
								20L	W1048
WA-GF200	10~600	1~100	34	0.3	30~60 (WK-EC26/100, h=80cm)	3~12 (work) 1~14 (CIP)	Antibodies, large proteins	200mL	W1049
								1L	W1050
								5L	W1051
								10L	W1052
								20L	W1053

Application: WA-GF200 Protein Separation

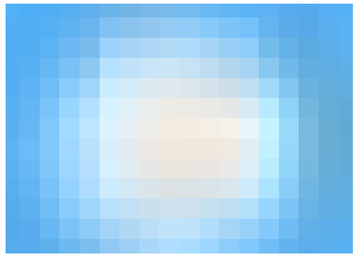


Chromatogram of WA-GF200 protein separation

Column: WK EC 16/70; Bed Height: 56.3 cm
Resin: WA-GF200
Proteins: IgG, BSA, β-lactoglobulin, cytochrome C, cytosine

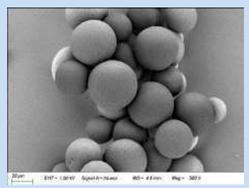
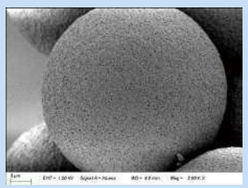
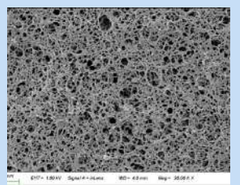
WH-HF3.1

WH-HF3.1 is a 3.1% agarose-based high-rigidity matrix created through emulsification, washing, and multiple cross-linking steps. With greater mechanical strength than Fast Flow beads, it serves as a robust matrix for affinity, hydrophobic, and ion exchange chromatography. Stable physicochemical properties, autoclave resistance at 121 °C, and fast flow make it suitable for large-scale purification.



Basic parameters

Resin name	Average particle size (μm)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Applications	Spec.	P/N
WH-HF3.1	75	0.5	90~500	2~12 (work) 2~14 (CIP)	High-rigidity agarose matrix for ligand coupling	200mL	W1089
						500mL	W1090
						1L	W1091
						5L	W1092
						10L	W1093

Electron micrographs of WH-HF3.1

WH-Core 400/700

WH-Core is a core-shell mixed-mode chromatography resin with an adsorptive “core” and exclusionary “shell.” The matrix is highly cross-linked agarose with good biocompatibility, minimal nonspecific adsorption, and high physicochemical stability. It can handle samples with moderate salt content and maintain high binding capacity.



WH-Core 400 and WH-Core 700 have exclusion limits of 400 kDa and 700 kDa, respectively, blocking large biomolecules (viruses, plasmids, exosomes, etc.) while allowing small impurities (HCPs, BSA, pigments, nucleic acid fragments, endotoxins, etc.) to enter the beads and be adsorbed by octylamine ligands in the core.

Basic parameters

Resin name	Average particle size (μm)	Pressure resistance (MPa)	Dynamic binding capacity (mg/ml)	pH stability	Applications	Spec.	P/N
WH-Core 400	90	0.5	≈ 22 (Ovalbumin)	3~13 (work) 2~14 (CIP)	Purification of viruses, plasmids, exosomes, and other large biomolecules	25mL	W1132
						100mL	W1133
						500mL	W1134
						1L	W1135
						5L	W1136
						10L	W1137
						20L	W1138
WH-Core 700	90	0.5	≈ 13 (Ovalbumin)	3~13 (work) 2~14 (CIP)	Purification of viruses, plasmids, exosomes, and other large biomolecules	25mL	W1139
						100mL	W1140
						500mL	W1141
						1L	W1142
						5L	W1143
						10L	W1144
						20L	W1145

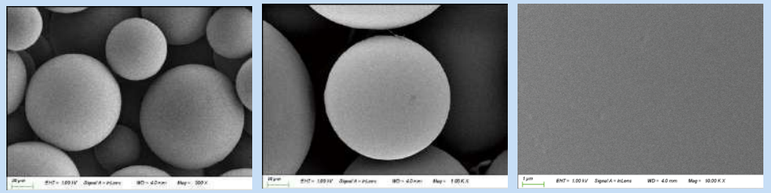
Dextran-Based Gel Filtration Resins

WD-G25/50 C/M/F/SF

WD-G Series are dextran-based gel filtration media produced via chemical cross-linking. These hydrophilic, porous beads are used for buffer exchange, desalting, and removal of small molecules from proteins, polysaccharides, and nucleic acids. They are also applicable in purifying peptides, oligonucleotides, antibiotics, synthetic drugs, natural products, and nanomaterials, as well as in wastewater treatment.



WD-G25 uses a dextran matrix with a separation range of 1,000–5,000 Da. Large molecules rapidly pass through the interstitial space between beads, while small molecules elute more slowly through the internal pores. Ideal for buffer exchange and group separation.



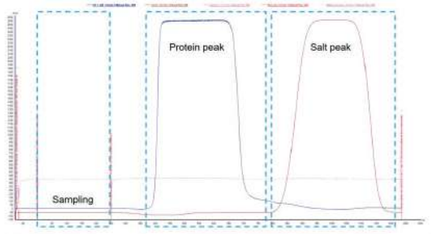
Electron micrographs of WD-G25 F

Basic parameters

Resin name	Separation range (kDa)		Average particle size of wet gel (μm)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
	Spherical molecule	Linear molecule						
WD-G25 C	1~5	0.1~5	320	0.3	< 650	2~13 (work) 2~13 (CIP)	25g	W1054
							100g	W1055
							500g	W1056
							1kg	W1057
							5kg	W1058
							25kg	W1059
							1L	W1060
WD-G25 M	1~5	0.1~5	140	0.3	< 430	2~13 (work) 2~13 (CIP)	25g	W1061
							100g	W1062
							500g	W1063
							1kg	W1064
							5kg	W1065
							25kg	W1066
							1L	W1067
WD-G25 F	1~5	0.1~5	90	0.3	< 240	2~13 (work) 2~13 (CIP)	25g	W1068
							100g	W1069
							500g	W1070
							1kg	W1071
							5kg	W1072
							25kg	W1073
							1L	W1074
WD-G25 SF	1~5	0.1~5	50	0.3	< 110	2~13 (work) 2~13 (CIP)	25g	W1075
							100g	W1076
							500g	W1077
							1kg	W1078
							5kg	W1079
							25kg	W1080
							1L	W1081
WD-G50 C	1~30	0.5~10	320	0.3	< 650	2~13 (work) 2~13 (CIP)	25g	W1104
							100g	W1105
							500g	W1106
							1kg	W1107
							5kg	W1108
							25kg	W1109
							1L	W1110
WD-G50 M	1~30	0.5~10	140	0.3	< 430	2~13 (work) 2~13 (CIP)	25g	W1111
							100g	W1112
							500g	W1113
							1kg	W1114
							5kg	W1115
							25kg	W1116
							1L	W1117

Resin name	Separation range (kDa)		Average particle size of wet gel (μm)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
	Spherical molecule	Linear molecule						
WD-G50 F	1~30	0.5~10	90	0.3	< 240	2~13 (work) 2~13 (CIP)	25g	W1118
							100g	W1119
							500g	W1120
							1kg	W1121
							5kg	W1122
							25kg	W1123
							1L	W1124
WD-G50 SF	1~30	0.5~10	50	0.3	< 110	2~13 (work) 2~13 (CIP)	25g	W1125
							100g	W1126
							500g	W1127
							1kg	W1128
							5kg	W1129
							25kg	W1130
							1L	W1131

Application: WD-G25F Desalination



Column: WK-EC 50/60, Bed Height: 50 cm
Resin: WD-G25F, CV = 1000 mL
Sample: Recombinant collagen protein, 50 kDa, 5 g/L,
20 mM sodium acetate, 500 mM NaCl, pH 5.0
Equilibration Buffer: 20 mM sodium acetate, pH 5.0
Flow Rate: 20 mL/min
Sample Load: 25% CV

WD-LH20

WD-LH20 is a hydroxypropyl-modified version of WD-G25. The introduction of hydroxypropyl groups gives it both hydrophilic and lipophilic properties, enabling use of organic solvents as mobile phases. Suitable for purification of active pharmaceutical ingredients from traditional Chinese medicine, as well as fine purification of antibiotics and synthetic drugs. The separation mechanism combines size exclusion, partitioning, and adsorption, enabling it to resolve structurally similar molecules.



Basic parameters

Resin name	Average particle size (μm)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Applications	Spec.	P/N
WD-LH20	80 (dry powder)	0.3	60~420	3~13 (work) 2~13 (CIP)	Natural products such as flavonoids, glycosides, as well as cholesterol, fatty acids, and hormones, etc.	25g	W1082
						100g	W1083
						500g	W1084
						1kg	W1085
						5kg	W1086
						25kg	W1087
						1L	W1088

Ordering Information of Gel Filtration Pre-packed Columns



Pre-packed Columns for Desalination



Pre-packed Columns for Fine Separation

Product name	Inner diameter/bed height (mm)	Column volume (mL)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	Separation range (kDa)	Spec.	P/N
WK-Col G25F	16/25	5	0.3	＜ 8	1~5	1×5mL	W6001
	16/25	5	0.3	＜ 8	1~5	5×5mL	W6002
WK-Col 16/10 G25	16/100	20	0.3	＜ 8	1~5	1 piece	W6003
WK-Col 26/10 G25	26/100	53	0.3	＜ 20	1~5	1 piece	W6004
WK-Col 16/60 GF75	16/600	120	0.3	1~3	3~70	1 piece	W6005
WK-Col 26/60 GF75	26/600	320	0.3	2~7	3~70	1 piece	W6006
WK-Col 16/60 GF200	16/600	120	0.3	1~3	10~600	1 piece	W6007
WK-Col 26/60 GF200	26/600	320	0.3	2~7	10~600	1 piece	W6008
WK-Col 16/60 GF30	16/600	120	0.3	1~3	＜ 10	1 piece	W6009
WK-Col 26/60 GF30	26/600	320	0.3	2~7	＜ 10	1 piece	W6010
WK-Col 16/60 6FF	16/600	120	0.3	2~4	10~4000	1 piece	W60101
WK-Col 16/90 6FF	16/900	180	0.3	2~4	10~4000	1 piece	W60102
WK-Col 26/60 6FF	26/600	320	0.3	4~8	10~4000	1 piece	W60103
WK-Col 26/90 6FF	26/900	477	0.3	4~8	10~4000	1 piece	W60104
WK-Col 16/60 4FF	16/600	120	0.3	1~3	60~20000	1 piece	W60105
WK-Col 16/90 4FF	16/900	180	0.3	1~3	60~20000	1 piece	W60106
WK-Col 16/90 GF200	16/900	180	0.3	1~3	10~600	1 piece	W60107
WK-Col 26/90 GF200	26/900	477	0.3	2~7	10~600	1 piece	W60108

02 Ion Exchange Chromatography (IEC)

Principles of IEC

Ion exchange chromatography (IEC) separates biomolecules based on differences in their isoelectric points. At a given pH, different biomolecules carry different types and amounts of charges. This technique utilizes these differences for separation. Depending on the type of functional groups, ion exchange chromatography is categorized into cation and anion exchange chromatography.

Key Features

- High controllability
- Strong selectivity
- High recovery rate
- High loading capacity
- Sample concentration capability

Ligands for IEC

Ligand	Group	Category
S	Sulfomethyl	Strong cation exchange
SP	Sulfopropyl	Strong cation exchange
CM	Carboxymethyl	Weak cation exchange
Q	Quaternary ammonium	Strong anion exchange
DEAE	Diethylaminoethyl	Weak anion exchange


WH-SP Fine


WA-DEAE XL


WA-Q FF


WH-DEAE

Fast Flow Series Ion Exchange Resins

WA-Q/SP/DEAE/CM FF

WA-FF Series are based on 6% highly cross-linked agarose resins with an average particle size of 90 μm, offering high flow rates. They are ideal for large-scale biomolecule purification.



Basic parameters

Resin name	Ion load (μmol/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Q FF	180~250 (Cl^-)	60~300	0.3	2~12 (Work) 2~14 (CIP)	25mL	W2019
					100mL	W2020
					500mL	W2021
					1L	W2022
					5L	W2023
					10L	W2024
					20L	W2025
WA-SP FF	180~250 (H^+)	60~300	0.3	4~13 (work) 3~14 (CIP)	25mL	W2026
					100mL	W2027
					500mL	W2028
					1L	W2029
					5L	W2030
					10L	W2031
					20L	W2032
WA-DEAE FF	110~160 (Cl^-)	60~300	0.3	2~9 (Work) 2~12 (permanent) 2~14 (CIP)	25mL	W2033
					100mL	W2034
					500mL	W2035
					1L	W2036
					5L	W2037
					10L	W2038
					20L	W2039
WA-CM FF	90~130 (H^+)	60~300	0.3	6~10 (Work) 4~13 (permanent) 2~14 (CIP)	25mL	W2040
					100mL	W2041
					500mL	W2042
					1L	W2043
					5L	W2044
					10L	W2045
					20L	W2046

High Performance Series Ion Exchange Resins

WA-Q/SP/DEAE HP

WA-HP Series are constructed from 6% cross-linked agarose with a fine particle size of 34 μm, delivering higher resolution and being suitable for intermediate or polishing purification stages.



Basic parameters

Resin name	Ion load (μmol/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Q HP	140~200 (Cl^-)	60~150	0.3	2~12 (Work) 2~14 (CIP)	25mL	W2047
					100mL	W2048
					500mL	W2049
					1L	W2050
					5L	W2051
					10L	W2052
					20L	W2053
WA-SP HP	150~200 (H^+)	60~150	0.3	4~13 (work) 3~14 (CIP)	25mL	W2054
					100mL	W2055
					500mL	W2056
					1L	W2057
					5L	W2058
					10L	W2059
					20L	W2060
WA-DEAE HP	110~160 (Cl^-)	60~150	0.3	2~9 (Work) 2~12 (permanent) 2~14 (CIP)	25mL	W2194
					100mL	W2195
					500mL	W2196
					1L	W2197
					5L	W2198
					10L	W2199
					20L	W2200

① Application: Resolution Comparison Between WA-SP FF and WA-SP HP

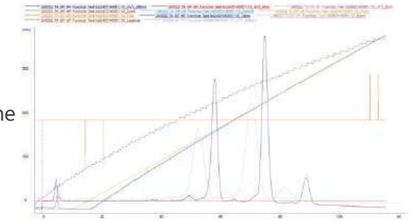
Column: WK-EC - 4.9 mL

Resins: WA-SP FF and WA-SP HP

Sample: Mixture of α-chymotrypsinogen, cytochrome C, and lysozyme

Binding Buffer: 20 mM PB, pH 6.8

Elution Buffer: 20 mM PB, 0.5 M NaCl, pH 6.8



Chromatograms of WA-SP FF (gray) and WA-SP HP (blue)

② Application: WA-Q HP in Recombinant Protein Purification

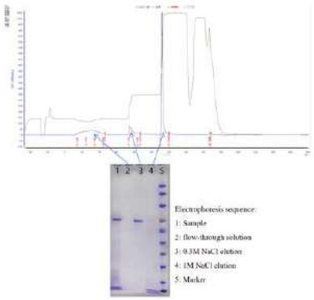
Column: WK-Col Q HP - 5 mL

Sample: Recombinant protein solution

Equilibration Buffer: 20 mM PB, 0.1 M NaCl, pH 7.5

Elution Buffer 1: 20 mM PB, 0.3 M NaCl, pH 7.5

Elution Buffer 2: 20 mM PB, 1 M NaCl, pH 7.5



Big Beads Series Ion Exchange Resins

WA-SP/Q BB

With an average particle size of 200 μm, these highly cross-linked agarose-based resins are optimized for samples with lower clarity. Their large particles minimize clogging and allow fast flow rates, suitable for processing large volumes in short durations.



Basic parameters

Resin name	Ion load (μmol/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-SP BB	180~250 (H^+)	90~450	0.3	4~13 (work) 3~14 (CIP)	25mL	W2061
					100mL	W2062
					500mL	W2063
					1L	W2064
					5L	W2065
					10L	W2066
					20L	W2067
WA-Q BB	180~250 (Cl^-)	90~450	0.3	2~12 (work) 2~14 (CIP)	25mL	W2068
					100mL	W2069
					500mL	W2070
					1L	W2071
					5L	W2072
					10L	W2073
					20L	W2074

High Capacity Series Ion Exchange Resins

WA-SP/Q XL

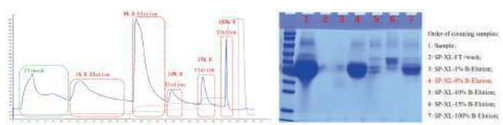
WA-XL Series feature linear dextran molecules covalently bound to the highly cross-linked agarose backbone, followed by functional group coupling. This structure reduces steric hindrance and significantly increases binding capacity for target molecules.



Basic parameters

Resin name	Dynamic Binding Capacity (mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-SP XL	≥ 160 (Lysozyme)	60~300	0.3	4~13 (work) 3~14 (CIP)	25mL	W2075
					100mL	W2076
					500mL	W2077
					1L	W2078
					5L	W2079
					10L	W2080
					20L	W2081
WA-Q XL	≥ 130 (BSA)	60~300	0.3	2~12 (work) 2~14 (CIP)	25mL	W2082
					100mL	W2083
					500mL	W2084
					1L	W2085
					5L	W2086
					10L	W2087
					20L	W2088

Application: WA-SP XL for Recombinant Protein Purification



Column: WK-Col SP XL - 1 mL

Sample: Recombinant protein solution (10 g/L)

Equilibration Buffer: 50 mM NaAc, 1 mM EDTA, pH 5.0

Elution Buffer: 50 mM NaAc, 1 M NaCl, 1 mM EDTA, pH 5.0

Flow Rate: 1 mL/min

High-Rigidity Agarose Ion Exchange Resins

WH-S/SP/Q/DEAE/MC/MA

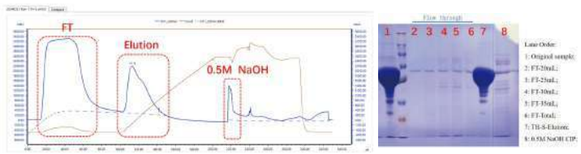
Welch Hard (WH) Series are based on chemically modified agarose to enhance mechanical strength, tolerating pressures up to 5 bar. Compared to WA-IEX FF series of similar particle size, WH series offers faster flow, lower back pressure, and higher binding capacity.



Basic parameters

Resin name	Dynamic Binding Capacity (mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WH-S	≥ 60 (β-lactoglobulin)	90~500	0.5	4~12 (Work) 3~14 (CIP)	25mL	W2201
					100mL	W2202
					500mL	W2203
					1L	W2204
					5L	W2205
					10L	W2206
					20L	W2207
WH-SP	≥ 30 (BSA)	90~500	0.5	4~13 (work) 3~14 (CIP)	25mL	W2089
					100mL	W2090
					500mL	W2091
					1L	W2092
					5L	W2093
					10L	W2094
					20L	W2095
WH-Q	≥ 100 (BSA)	90~500	0.5	2~12 (Work) 2~14 (CIP)	25mL	W2096
					100mL	W2097
					500mL	W2098
					1L	W2099
					5L	W2100
					10L	W2101
					20L	W2102
WH-DEAE	≥ 90 (Ovalbumin)	90~500	0.5	2~9 (work) 2~12 (permanent) 2~14 (CIP)	100mL	W2104
					500mL	W2105
					1L	W2106
					5L	W2107
					10L	W2108
					20L	W2109
WH-MC	≥ 45 (BSA)	90~500	0.5	3~12 (work) 3~14 (CIP)	25mL	W2117
					100mL	W2118
					500mL	W2119
					1L	W2120
					5L	W2121
					10L	W2122
					20L	W2123
WH-MA	≥ 30 (BSA)	90~500	0.5	3~12 (Work) 2~14 (CIP)	25mL	W2124
					100mL	W2125
					500mL	W2126
					1L	W2127
					5L	W2128
					10L	W2129
					20L	W2130

Application: WH-S for Recombinant Collagen Purification



Column: WK-Col Hard S - 5 mL

Sample: Recombinant collagen solution

Equilibration Buffer: 100 mM NaAc, pH 5.0

Elution Buffer: 50 mM NaAc, 1 M NaCl, pH 5.0

High-Resolution, High-Rigidity Seires Ion Exchange Resins

WH-Q/SP/MA/MC Fine

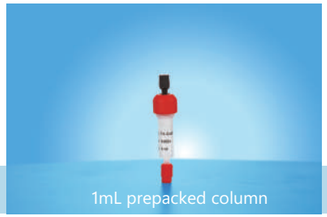
WH Fine Series couple functional groups to a rigid agarose matrix for enhanced resolution (compared to WH Series), ideal for intermediate or final purification steps.



Basic parameters

Resin name	Dynamic Binding Capacity (mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WH-Q Fine	≥ 55 (BSA)	90~150	0.5	2~12 (work) 2~14 (CIP)	25mL	W2131
					100mL	W2132
					500mL	W2133
					1L	W2134
					5L	W2135
					10L	W2136
					20L	W2137
WH-SP Fine	≥ 90 (Lysozyme)	90~150	0.5	4~13 (work) 3~14 (CIP)	25mL	W2138
					100mL	W2139
					500mL	W2140
					1L	W2141
					5L	W2142
					10L	W2143
					20L	W2144
WH-MA Fine	45~85 (monoclonal antibodies)	90~150	0.5	3~12 (work) 2~14 (CIP)	25mL	W2145
					100mL	W2146
					500mL	W2147
					1L	W2148
					5L	W2149
					10L	W2150
					20L	W2151
WH-MC Fine	60~90 (monoclonal antibodies)	90~150	0.5	3~12 (work) 2~14 (CIP)	25mL	W2152
					100mL	W2153
					500mL	W2154
					1L	W2155
					5L	W2156
					10L	W2157
					20L	W2158

Ordering Information of Pre-packed Columns Ion Exchange


1mL prepacked column


5mL prepacked column

Basic parameters

Product name	Spec.	P/N
WK-Col Q FF	1x1mL	W6339
	5x1mL	W6013
	1x5mL	W6014
	5x5mL	W6015
WK-Col DEAE FF	1x1mL	W6340
	5x1mL	W6016
	1x5mL	W6017
	5x5mL	W6018
WK-Col CM FF	1x1mL	W6341
	5x1mL	W6019
	1x5mL	W6020
	5x5mL	W6021
WK-Col SP FF	1x1mL	W6388
	5x1mL	W6022
	1x5mL	W6023
	5x5mL	W6024
WK-Col Q HP	1x1mL	W6342
	5x1mL	W6025
	1x5mL	W6026
	5x5mL	W6027
WK-Col SP HP	1x1mL	W6343
	5x1mL	W6028
	1x5mL	W6029
	5x5mL	W6030

Product name	Spec.	P/N
WK-Col Q FF	1x5mL	W6058
	5x5ml	W6059
WK-Col Hard IEX Select Kit 1	5x1mL	W6060
WK-Col Hard IEX Select Kit 2	5x5mL	W6061
WK-Col Q Fine	1x1mL	W6353
	5x1mL	W6062
	1x5mL	W6063
	5x5mL	W6064
WK-Col SP Fine	1x1 mL	W6354
	5x1mL	W6065
	1 x5mL	W6066
	5x5mL	W6067
WK-Col MC Fine	1x1mL	W6355
	5x1mL	W6068
	1 x5mL	W6069
	5x5mL	W6070
WK-Col MA Fine	1x1 mL	W6356
	5x1mL	W6071
	1x5mL	W6072
	5x5mL	W6073
WH-Col Fine IEX Select kit 1	4x1mL	W6074
WH-Col Fine IEX Select kit 2	4x5mL	W6075
WK-Col 16/10 Q FF	1 piece.	W6076
WK-Col 26/10 Q FF	1 piece	W6077
WK-Col 16/10 DEAE FF	1 piece	W6078
WK-Col 26/10 DEAE FF	1 piece	W6079
WK-Col 16/10 CM FF	1 piece	W6080
WK-Col 26/10 CM FF	1 piece	W6081

Product name	Spec.	P/N
WK-Col Q BB	1x1 mL	W6344
	5x1mL	W6031
	1x5mL	W6032
	5x5mL	W6033
WK-Col SP BB	1x1mL	W6345
	5x1mL	W6034
	1x5mL	W6035
	5x5mL	W6036
WK-Col Q XL	1x1mL	W6346
	5x1mL	W6037
	1x5ml	W6038
	5x5mL	W6039
WK-Col SP XL	1x1mL	W6347
	5x1mL	W6040
	1x5mL	W6041
	5x5mL	W6042
WK-Col IEX Select Kit 1	10x1mL	W6043
WK-Col IEX Select Kit 2	10x5mL	W6044
WK-Col Hard Q	1x1mL	W6348
	5x1mL	W6045
	1x5mL	W6046
	5x5mL	W6047
WK-Col Hard DEAE	1x1mL	W6349
	5x1mL	W6048
	1x5mL	W6049
	5x5mL	W6050
WK-Col Hard S	1x1mL	W6350
	5x1mL	W6051
	1x5mL	W6052
	5x5mL	W6053
WK-Col Hard MC	1x1mL	W6351
	5x1mL	W6054
	1x5mL	W6055
	5x5mL	W6056
WK-Col Hard MA	1x1 mL	W6352
	5x1mL	W6057

Product name	Spec.	P/N
WK-CoL 16/10 SPFF	1 piece.	W6082
WK-Col 26/10 SP FF	1 piece	W6083
WK-Col 16/10 Q HP	1 piece	W6084
WK-Col 26/10 Q HP	1 piece	W6085
WK-CoL 16/10 SP HP	1 piece	W6086
WK-CoL 26/10 SP HP	1 piece	W6087
WK-Col16/10 Q BB	1 piece.	W6088
WK-Col 26/10 Q BB	1 piece	W6089
WK-CoL 16/10 SP BB	1 piece	W6090
WK-CoL 26/10 SP BB	1 piece	W6091
WK-Col 16/10 Q XL	1 piece	W6092
WK-Col 26/10 Q XL	1 piece	W6093
WK-CoL 16/10 SP XL	1 piece.	W6094
WK-CoL26/10 SP XL	1 piece	W6095
WK-Col 16/10 Hard Q	1 piece	W6096
WK-Col 26/10 Hard O	1 piece	W6097
WK-Col16/10 Hard DEAE	1 piece	W6098
WK-Col 26/10 Hard DEAE	1 piece	W6099
WK-Col16/10 Hard S	1 piece.	W6100
WK-Col26/10 Hard S	1 piece	W6101
WK-Col 16/10 Hard MC	1 piece	W6102
WK-Col 26/10 Hard MC	1 piece	W6103
WK-Col 16/10 Hard MA	1 piece	W6104
WK-Col 26/10 Hard MA	1 piece	W6105
WK-Col16/10 0 Fine	1 piece.	W6106
WK-Col 26/10 0 Fine	1 piece	W6107
WK-Col 16/10 SP Fine	1 piece	W6108
WK-Col26/10 SP Fine	1 piece	W6109
WK-Col16/10 MC Fine	1 piece	W6110
WK-Col 26/10 MC Fine	1 piece	W6117
WK-Col16/10 MA Fine	1 piece	W6112
WK-Col 26/10 MA Fine	1 piece	W6113

03 Hydrophobic Interaction Chromatography (HIC)

Principles of HIC

Hydrophobic interaction chromatography (HIC) separates substances by leveraging interactions between hydrophobic groups on biomolecules and hydrophobic ligands on the stationary phase. Salt ions disrupt the hydration shell around biomolecules, promoting interaction with hydrophobic ligands. Common ligands include butyl thioether, butyl, octyl, and phenyl groups.

Advantages

- Sample loading under high salt, elution under low salt—well-compatible with ion exchange chromatography
- Strong selectivity
- Excellent physicochemical stability

Factors Influencing HIC Performance

1 Salt Type and Concentration

Salts increase interfacial tension between proteins and resins, disrupting hydration layers and enhancing hydrophobic interactions, thereby promoting protein binding to the matrix.

Salts exert varying effects on HIC. Sulfates like Na_2SO_4, K_2SO_4, and $(NH_4)_2SO_4$ enhance hydrophobicity by strengthening protein salting-out effects and surface tension, whereas $MgCl_2$, while also strengthening surface tension, increases solubility and hence diminishes hydrophobicity and hinders protein binding.

High salt concentrations enhance hydrophobic interactions. A salt concentration near but below the target protein's salting-out point optimizes binding without causing precipitation. Typically, a 1 mol/L ammonium sulfate solution is sufficient to promote binding of highly soluble proteins to resins.

② pH

HIC typically uses neutral phosphate buffers. While pH changes have limited effect, higher pH may slightly reduce protein hydrophobicity. pH adjustments are rarely used for modulating HIC.

③ Temperature

Higher temperatures enhance hydrophobic interactions but may compromise protein activity. HIC should be performed under stable temperature conditions to avoid unwanted influences.



Fast Flow Series HIC Resins

WA-Butyl/Octyl/Phenyl FF

WA-FF Series are based on 4% or 6% highly cross-linked agarose resins with a 90 μm average particle size and 0.3 MPa pressure resistance, offering high flow rates.



Basic parameters

Resin name	Dynamic Binding Capacity (mg/mL) human serum albumin	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
WA-Butyl 4FF	≈ 26	60~150	3~13 (work) 2~14 (CIP)	25mL	W3001
				100mL	W3002
				500mL	W3003
				1L	W3004
				5L	W3005
				10L	W3006
				20L	W3007
WA-Octyl 4FF	≈ 7	60~150	3~13 (work) 2~14 (CIP)	25mL	W3008
				100mL	W3009
				500mL	W3010
				1L	W3011
				5L	W3012
				10L	W3013
				20L	W3014
WA-Phenyl FF(HS)	≈ 36	60~150	3~13 (work) 2~14 (CIP)	25mL	W3036
				100mL	W3037
				500mL	W3038
				1L	W3039
				5L	W3040
				10L	W3041
				20L	W3042

Resin name	Dynamic Binding Capacity (mg/mL) human serum albumin	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
WA-Phenyl FF(LS)	≈ 24	150~300	3~13 (work) 2~14 (CIP)	25mL	W3043
				100mL	W3044
				500mL	W3045
				1L	W3046
				5L	W3047
				10L	W3048
				20L	W3049
WA-Butyl S	≈ 26	150~300	3~13 (work) 2~14 (CIP)	25mL	W3029
				100mL	W3030
				500mL	W3031
				1L	W3032
				5L	W3033
				10L	W3034
				20L	W3035

Application Examples

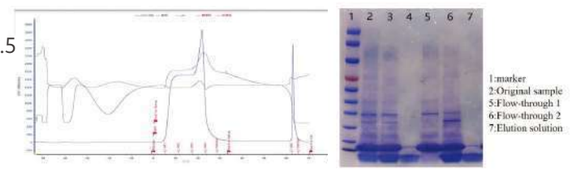
① Application: WA-Butyl 4FF for Peptide Purification

Column: WK-Col Butyl 4FF - 5 mL

Equilibration Buffer: 20 mM Tris, 1 M $(NH_4)_2SO_4$, pH 7.5

Elution Buffer: 20 mM Tris, pH 7.5

Sample: Peptide solution



② Application: WA-Phenyl FF (HS) for Somatrogon Purification

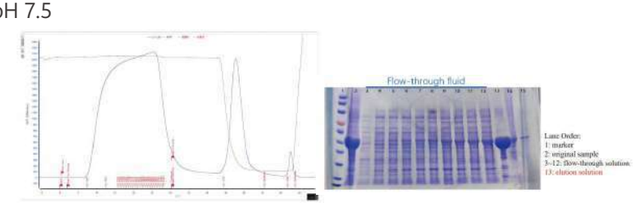
Column: WK-Col Phenyl FF (HS) - 5 mL

Equilibration Buffer: 20 mM PB, 0.05 M NaCl, pH 7.5

Elution Buffer: Water

Sample: Somatrogon solution

Cleaning Solution: 0.5 M NaOH



High Performance Series HIC Resins

WA-Butyl /Octyl/Phenyl HP

WA-HP Series are based on 6% cross-linked agarose with an average particle size of 34 μm. Its smaller particle size provides higher resolution compared to the FF series, making it ideal for intermediate and polishing steps in biomolecule purification.



Basic parameters

Resin name	Dynamic Binding Capacity (mg/mL)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
WA-Butyl HP	≈ 38 (β-Lactoglobulin)	60~120	3~12 (work) 2~14 (CIP)	25mL	W3015
				100mL	W3016
				500mL	W3017
				1L	W3018
				5L	W3019
				10L	W3020
				20L	W3021
WA-Octyl HP	≈ 35 (BSA)	60~120	3~13 (work) 2~14 (CIP)	25mL	W3022
				100mL	W3023
				500mL	W3024
				1L	W3025
				5L	W3026
				10L	W3027
				20L	W3028
WA-Phenyl HP	≈ 45 (α-Pancreatic coagulase protease element)	60~150	3~12 (work) 3~13 (CIP)	25mL	W3050
				100mL	W3051
				500mL	W3052
				1L	W3053
				5L	W3054
				10L	W3055
				20L	W3056

High-Rigidity Agarose HIC Resins

WH-Phenyl/Octyl/Butyl

WH resins use a high-rigidity agarose matrix, offering low back pressure and high flow rates. They are well-suited for large-scale purification of biomolecules.



Basic parameters

Resin name	Dynamic Binding Capacity(mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WH-Phenyl (HS)	≈ 27 (BSA)	150~350	0.5	3~13 (work) 2~14 (CIP)	25mL	W3057
					100mL	W3058
					500mL	W3059
					1L	W3060
					5L	W3061
					10L	W3062
					20L	W3063
WH-Phenyl (LS)	≈ 15 (BSA)	150~350	0.5	3~13 (work) 2~14 (CIP)	25mL	W3064
					100mL	W3065
					500mL	W3066
					1L	W3067
					5L	W3068
					10L	W3069
					20L	W3070
WH-Octyl	≈ 25 (BSA)	150~350	0.5	3~13 (work) 2~14 (CIP)	25mL	W3071
					100mL	W3072
					500mL	W3073
					1L	W3074
					5L	W3075
					10L	W3076
					20L	W3077
WH-Butyl	≈ 27 (BSA)	150~350	0.5	3~13 (work) 2~14 (CIP)	25mL	W3078
					100mL	W3079
					500mL	W3080
					1L	W3081
					5L	W3082
					10L	W3083
					20L	W3084

High-Rigidity, High-Resolution Series HIC Resins

WH-Phenyl/Octyl/Butyl Fine

Constructed from fine particles of rigid agarose with an average size of 40 μm, WH-Fine series combine high resolution with low back pressure. It is suitable for both intermediate and polishing steps in downstream protein purification.



Basic parameters

Resin name	Dynamic Binding Capacity(mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WH-Phenyl Fine	≈ 19 (BSA)	90~180	0.5	3~13 (work) 2~14 (CIP)	25mL	W3085
					100mL	W3086
					500mL	W3087
					1L	W3088
					5L	W3089
					10L	W3090
					20L	W3091
WH-Octyl Fine	≈ 10 (BSA)	90~180	0.5	3~13 (work) 2~14 (CIP)	25mL	W3092
					100mL	W3093
					500mL	W3094
					1L	W3095
					5L	W3096
					10L	W3097
					20L	W3098
WH-Butyl Fine	≈ 37 (BSA)	90~180	0.5	3~13 (work) 2~14 (CIP)	25mL	W3099
					100mL	W3100
					500mL	W3101
					1L	W3102
					5L	W3103
					10L	W3104
					20L	W3105

Ordering Information of HIC Pre-packed Columns


WK-Col Phenyl FF (HS) - 4.9 mL


WK-Col Phenyl FF (HS) - 5 mL

Product name	Spec.	P/N
WK-Col Butyl 4FF	1x1mL	W6357
	5x1mL	W6115
	1x5mL	W6116
	5x5mL	W6117
WK-Col Butyl-S FF	1x1mL	W6358
	5x1mL	W6118
	1x5mL	W6119
	5x5mL	W6120
WK-Col Octyl 4FF	1x1mL	W6359
	5x1mL	W6121
	1x5mL	W6122
	5x5mL	W6123
WK-Col Phenyl FF(LS)	1x1mL	W6360
	5x1mL	W6124
	1x5mL	W6125
	5x5mL	W6126
WK-Col Phenyl FF(HS)	1x1mL	W6361
	5x1mL	W6127
	1x5mL	W6128
	5x5mL	W6129
WK-Col HIC Select Kit1	5x1mL	W6130

Product name	Spec.	P/N
WK-Col Hard Butyl	1x1mL	W6151
	5x5mL	W6152
WK-Col Hard Butyl-S	1x1mL	W6369
	5x1mL	W6153
	1x5mL	W6154
	5x5mL	W6155
WH-Col Hard HIC Select kit 1	1x1mL	W6156
WH-Col Hard HIC Select kit 2	5x5mL	W6157
WK-Col Phenyl Fine	1x1mL	W6370
	5x1mL	W6158
	1x5mL	W6159
	5x5mL	W6160
WK-Col Octyl Fine	1x1mL	W6371
	5x1mL	W6161
	1x5mL	W6162
	5x5mL	W6163
WK-Col Butyl Fine	1x1mL	W6372
	5x1mL	W6164
	1x5mL	W6165
	5x5mL	W6166
WK-Col Butyl-S Fine	1x1mL	W6373
	5x1mL	W6167
	1x5mL	W6168
	5x5mL	W6169

Product name	Spec.	P/N
WK-Col HIC Select Kit2	5x5mL	W6131
WK-Col Butyl HP	1x1 mL	W6362
	5x1mL	W6132
	1x5mL	W6133
	5x5mL	W6134
WK-Col Octyl HP	1x1mL	W6363
	5x1mL	W6135
	1x5mL	W6136
	5x5mL	W6137
WK-Col Phenyl HP	1x1mL	W6364
	5x1mL	W6138
	1x5ml	W6139
	5x5mL	W6140
WK-Col Hard Phenyl (HS)	1x1mL	W6365
	5x1mL	W6141
	1x5mL	W6142
	5x5mL	W6143
WK-Col Hard Phenyl (LS)	10x1mL	W6366
	10x5mL	W6144
	1x1mL	W6145
	5x1mL	W6146
WK-Col Hard Octyl	1x5mL	W6367
	5x5mL	W6147
	1x1mL	W6148
	5x1mL	W6149
WK-Col Hard Butyl	1x5mL	W6368
	5x5mL	W6150

Product name	Spec.	P/N
WK-Col 16/10 Phenyl FF (HS)	1 piece	W6170
WK-Col 26/10 Phenyl FF (HS)	1 piece	W6171
WK-Col 16/10 Phenyl FF (LS)	1 piece	W6172
WK-Col 26/10 Phenyl FF (LS)	1 piece	W6173
WK-Col 16/10 Phenyl HP	1 piece	W6174
WK-Col 26/10 Phenyl HP	1 piece	W6175
WK-Col 16/10 Octyl 4FF	1 piece	W6176
WK-Col 26/10 Octyl 4FF	1 piece	W6177
WK-Col 16/10 Butyl 4FF	1 piece	W6178
WK-Col 26/10 Butyl 4FF	1 piece	W6179
WK-Col 16/10 Butyl-S FF	1 piece	W6180
WK-Col 26/10 Butyl-S FF	1 piece	W6181
WK-Col 16/10 Hard Phenyl (HS)	1 piece	W6182
WK-Col 26/10 Hard Phenyl (HS)	1 piece	W6183
WK-Col 16/10 Hard Phenyl(LS)	1 piece	W6184
WK-Col 26/10 Hard Phenyl (LS)	1 piece	W6185
WK-Col 16/10 Phenyl Fine	1 piece	W6186
WK-Col 26/10 Phenyl Fine	1 piece	W6187
WK-Col 16/10 Hard Octyl	1 piece	W6188
WK-Col 26/10 Hard Octyl	1 piece	W6189
WK-Col 16/10 Hard Butyl	1 piece	W6190
WK-Col 26/10 Hard Butyl	1 piece	W6191
WK-Col 16/10 Hard Butyl-S	1 piece	W6192
WK-Col 26/10 Hard Butyl-S	1 piece	W6193

04 Reversed-Phase Chromatography (RPC)

Principles of RPC



Reversed-phase chromatography (RPC) contrasts with normal-phase chromatography. In normal-phase chromatography, the stationary phase is more polar than the mobile phase, and compounds with greater polarity exhibit longer retention times. Conversely, reversed-phase chromatography employs a less polar stationary phase and a more polar mobile phase. In this system, compounds with lower polarity exhibit stronger retention. The separation mechanism is based on hydrophobic interactions between the hydrophobic groups on the analytes and those on the stationary phase—similar to hydrophobic interaction chromatography. As a result, the non-polar stationary phase and polar mobile phase enable compounds to elute in order of increasing polarity, achieving effective separation.

WP-RPC Series Reversed-Phase Resins

WP-RPC 15/30

WP-RPC Series is a line of polymer-based resins composed of monodisperse, porous, and rigid polystyrene/divinylbenzene microspheres. These particles are not modified with additional ligands, instead utilizing their inherent hydrophobicity to achieve separation. The well-controlled pore size distribution enables high resolution, reproducibility, and scalability, making WP-RPC media ideal for various reversed-phase applications.

Basic parameters

Resin name	Average particle size (μm)	Pressure resistance (MPa)	Dynamic binding capacity (mg/ml)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
WP-RPC15	15	10	≈ 18 (BSA) ≈ 14 (bacillus peptide) ≈ 45 (insulin)	＜ 400	2~12 (work) 1~14 (CIP)	25mL	W4001
						100mL	W4002
						500mL	W4003
						1L	W4004
						5L	W4005
						10L	W4006
						20L	W4007
WP-RPC30	30	10	≈ 18 (BSA) ≈ 14 (bacillus peptide) ≈ 45 (insulin)	＜ 1000	2~12 (work) 1~14 (CIP)	25mL	W4008
						100mL	W4009
						500mL	W4010
						1L	W4011
						5L	W4012
						10L	W4013
						20L	W4014



05 Affinity Chromatography

Principles of Affinity Chromatography

Affinity chromatography exploits the specific and reversible interactions between biological molecules-such as antigen-antibody, enzyme-substrate, hormone-receptor, or complementary DNA strands-to achieve high-purity separations.

Advantages of Affinity Chromatography

Fast and efficient · · · · · · High selectivity · · · · · · Achieves >90% purity in a single purification step

Resin Structures

1 Matrix

A solid support for ligand immobilization, typically agarose or dextran gels

2 Spacer Arm

A linker of appropriate length connecting the matrix to the ligand

3 Ligand

A molecule capable of specifically and reversibly binding the target biomolecule

Protein A Affinity Chromatography Resins

WH-Protein A



WH-Protein A is an advanced affinity resin comprising alkali-resistant Protein A covalently bound to a rigid agarose matrix via epoxy activation. Compared to traditional Protein A resins, it offers improved ligand stability, faster flow rates, and lower backpressure. It is suitable for capturing monoclonal antibodies and Fc-fusion proteins from large-scale cell culture supernatants, as well as polyclonal antibodies from ascites or plasma.

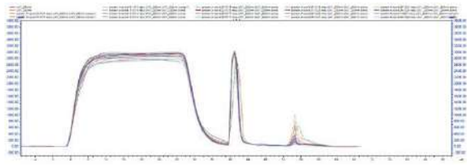
The Protein A ligand is a recombinant fragment expressed in E. coli, engineered with alkali-resistant amino acid substitutions and lacking protease-sensitive sites, ensuring excellent stability. The production process is entirely animal-origin-free. This media is compatible with in-place cleaning using 0.1–0.5 M NaOH, eliminating the need for expensive, corrosive cleaning agents and reducing production costs. It is well-suited for industrial-scale antibody production.

Basic parameters

Resin name	Average particle size (μm)	Dynamic Binding Capacity(mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WH-Protein A	75	≥ 55 (human IgG)	90~300	0.5	3~12 (work) 2~13 (CIP)	25mL	W5001
						100mL	W5002
						500mL	W5003
						1L	W5004
						5L	W5005
						10L	W5006
						20L	W5007

❶ Application : WH-Protein A Lifetime Study

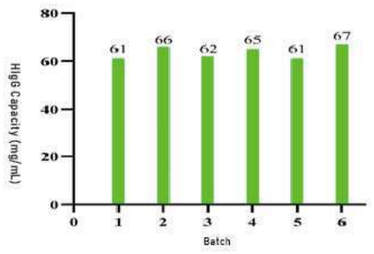
Column: WK-Col Hard Protein A - 1 mL
Equilibration Buffer: 20 mM PB, 150 mM NaCl, pH 7.4
Elution Buffer: 0.1 M citric acid, pH 3.0
Sample: CHO cell culture supernatant
Cleaning Solution: 0.1 M NaOH



WH-Protein A 100-cycle Chromatogram

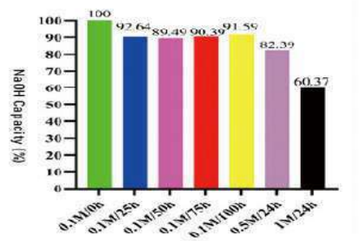
❷ Application : WH-Protein A Batch-to-Batch Consistency

Binding capacity remained consistently
above 60 mg/mL across six production batches.



❸ Application : WH-Protein A Alkali Stability

1. Maintained 90% capacity after soaking in 0.1 M NaOH for 100 h
2. Retained 82% capacity after 24 h in 0.5 M NaOH
3. Still showed 60% capacity after 24 h in 1 M NaOH



Protein G Affinity Chromatography Resins

WA-Protein G 4FF



WA-Protein G 4FF is prepared by coupling Protein G to the WA-4FF matrix via cyanogen bromide activation. Compared with Protein A, Protein G has a broader binding spectrum. In addition to strong binding to the Fc region, it also exhibits weak interaction with Fab fragments. This makes WA-Protein G 4FF suitable for purifying antibodies or antibody fragments from culture supernatants and sera of various species.

Basic parameters

Resin name	Average particle size (μm)	Pressure resistance (MPa)	Dynamic binding capacity (mg/ml)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
WA-Protein G 4FF	90	0.3	≈ 20 (human IgG)	60~250	3~9 (work) 2~10 (CIP)	25mL	W5008
						100mL	W5009
						500mL	W5010
						1L	W5011
						5L	W5012
						10L	W5013
						20L	W5014

Protein L Affinity Chromatography Resin

WH-Protein L

WH-Protein L is a novel affinity resin synthesized by coupling alkali-resistant Protein L to a rigid agarose matrix using epoxy chemistry. Optimized pore size enhances antibody binding capacity. This resin binds to the variable region of kappa light chains and is ideal for capturing Fab fragments, single-chain variable fragments (scFv), and domain antibodies (Dabs).



Basic parameters

Resin name	Average particle size (μm)	Pressure resistance (MPa)	Dynamic binding capacity (mg/ml)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
WH-Protein L	85	0.5	≈ 25 (human Fab, retention time 4 min)	90~300	2~10 (work) 2~12 (CIP)	25mL	W5214
						100mL	W5215
						500mL	W5216
						1L	W5217
						5L	W5218
						10L	W5219
						20L	W5220

His-Tagged Protein Purification Resins

WA-Ni FF/HP (NTA/IDA/TED)

WA-Ni FF (Fast Flow) is a metal affinity chromatography resin pre-charged with Ni^{2+} ions on agarose gels functionalized with NTA, IDA, or TED chelators. It features high binding capacity, excellent selectivity, easy regeneration, and low cost. Widely used in downstream bioprocessing for purifying recombinant His-tagged proteins and peptides.



WA-Ni FF (NTA)



WA-Ni FF (IDA)

Basic parameters

Resin name	Dynamic Binding Capacity(mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Ni FF (NTA)	≈ 40 (His-tagged protein)	60~150	0.3	3~12 (work) 2~14 (CIP)	25mL	W5015
					100mL	W5016
					500mL	W5017
					1L	W5018
					5L	W5019
					10L	W5020
					20L	W5021
WA-Ni HP (NTA)	≈ 40 (His-tagged protein)	60~150	0.3	3~12 (work) 2~14 (CIP)	25mL	W5022
					100mL	W5023
					500mL	W5024
					1L	W5025
					5L	W5026
					10L	W5027
					20L	W5028
WA-Ni FF (IDA)	≈ 40 (His-tagged protein)	60~150	0.3	3~12 (work) 2~14 (CIP)	25mL	W5373
					100mL	W5374
					500mL	W5375
					1L	W5376
					5L	W5377
					10L	W5378
					20L	W5379

Basic parameters

Resin name	Dynamic Binding Capacity(mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Ni HP (IDA)	≈ 40 (His-tagged protein)	60~150	0.3	3~12 (Work) 2~14 (CIP)	25mL	W5380
					100mL	W5381
					500mL	W5382
					1L	W5383
					5L	W5384
					10L	W5385
					20L	W5386
WA-Ni FF (TED)	≥ 10 (His-tagged protein)	60~150	0.3	2~12 (Work) 2~14 (CIP)	25mL	W5394
					100mL	W5395
					500mL	W5396
					1L	W5397
					5L	W5398
					10L	W5399
					20L	W5400
WA-Ni HP (TED)	≥ 10 (His-tagged protein)	60~150	0.3	3~13	25mL	W5401
					100mL	W5402
					500mL	W5403
					1L	W5404
					5L	W5405
					10L	W5406
					20L	W5407

Application Examples

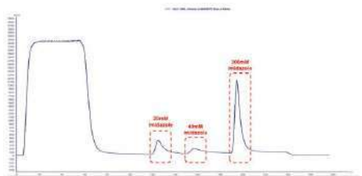
1 WA-Ni FF (NTA) for His-Tagged Protein Purification

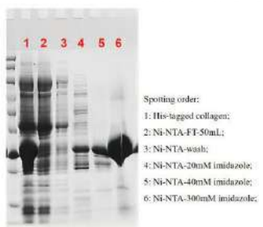
Column: WK-Col Ni FF (NTA) - 5 mL

Buffers:

1. Equilibration: 50 mM Tris-HCl, 300 mM NaCl, pH 7.8
2. Elution 1: +20 mM imidazole
3. Elution 2: +40 mM imidazole
4. Elution 3: +300 mM imidazole

Sample Volume: 50 mL





Spotting order:
1: His-tagged collagen;
2: Ni-NTA-FT-50mL;
3: Ni-NTA-wash;
4: Ni-NTA-20mM imidazole;
5: Ni-NTA-40mM imidazole;
6: Ni-NTA-300mM imidazole;

2 WA-Ni FF (TED) Performance after Chemical Treatment

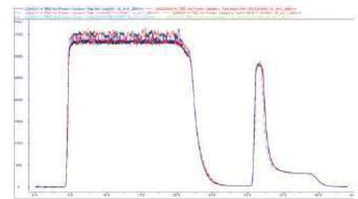
Column: WK-Col Ni FF (TED)-1 mL

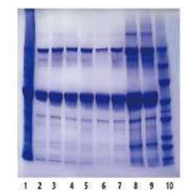
Buffer: 20 mM PB + 0.5 M NaCl, pH 7.4

Elution: 500 mM imidazole in same buffer

Sample: His-tagged protein

Treatment: Resin soaked in 8 M urea, 1 M NaOH, 20 mM β-mercaptoethanol, 5 mM DTT, and 10 mM EDTA for 24 h prior to use





1.Sample
2.Ni TED elution (control)
3.Ni TED elution (8M urea 24h)
4.Ni TED elution (1M NaOH 24h)
5.Ni TED elution (20mM β-mercaptoethanol 24h)
6.Ni TED elution (10mM EDTA 24h)
7.Ni TED elution (5mM DTT 24h)
8.Ni IDA elution
9.Ni NTA elution
10.Marker

Electropherogram (12% precast gel; spotting volume: 10 µL; all samples No. 1–9 were diluted 4-fold prior and spotted)



Immobilized Metal Affinity Chromatography (IMAC) Resins

WA-IMAC FF/HP & WA-Chelating FF/HP

WA-IMAC FF/HP

WA-IMAC is an uncharged IMAC resin consisting of cross-linked agarose functionalized with NTA. It can be charged with divalent or trivalent metal ions such as Cu^{2+}, Zn^{2+}, Ni^{2+}, Co^{2+}, or Fe^{3+} to interact with histidine, cysteine, and tryptophan residues for protein separation. It offers excellent specificity, chemical stability, and high flow performance.



WA-Chelating FF/HP

Functionalized with IDA ligands covalently linked to agarose, WA-Chelating binds transition metal ions (e.g., Cu^{2+}, Co^{2+}, Ni^{2+}, Zn^{2+}), which in turn bind to protein residues for purification.

Basic parameters

Resin name	Chelating metal capacity (μmoL/mL media)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-IMAC FF	≈ 15 (Ni^{2+})	60~150	0.3	3~12 (Work) 2~14 (CIP)	25mL	W5029
					100mL	W5030
					500mL	W5031
					1L	W5032
					5L	W5033
					10L	W5034
					20L	W5035
WA-IMAC HP	≈ 15 (Ni^{2+})	60~150	0.3	3~12 (Work) 2~14 (CIP)	25mL	W5036
					100mL	W5037
					500mL	W5038
					1L	W5039
					5L	W5040
					10L	W5041
					20L	W5042

Resin name	Chelating metal capacity (μmoL/mL media)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Chelating FF	≈ 34 (Cu^{2+})	60~150	0.3	3~12 (Work) 2~14 (CIP)	25mL	W5043
					100mL	W5044
					500mL	W5045
					1L	W5046
					5L	W5047
					10L	W5048
					20L	W5049
WA-Chelating HP	≈ 34 (Cu^{2+})	60~150	0.3	3~12 (Work) 2~14 (CIP)	25mL	W5387
					100mL	W5388
					500mL	W5389
					1L	W5390
					5L	W5391
					10L	W5392
					20L	W5393

GST-Tagged Protein Purification Resins

WA-GST 4FF/4B

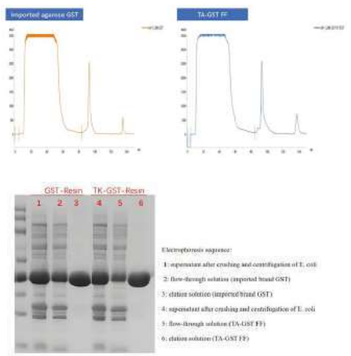
WA-GST Series consist of glutathione covalently bound to highly cross-linked agarose. Designed for the specific purification of glutathione S-transferase (GST) and GST fusion proteins, these resins enable one-step purification with high yield and purity. The media are pressure-resistant, fast-flowing, and compatible with mild conditions that help preserve protein activity.



Basic parameters

Resin name	Ligand density (μmol GST/mL media)	GST fusion protein loading (mg/mL)	Pressure resistance (MPa)	Recommended flow rate (cm/h)	pH stability	Spec.	P/N
WA-GST 4FF	120~320	≈ 10	0.3	60~120	3~12	25mL	W5050
						100mL	W5051
						500mL	W5052
						1L	W5053
						5L	W5054
						10L	W5055
						20L	W5056
WA-GST 4B	200~400	≥ 25	0.01	< 75	4~13 (work) 4~14 (CIP)	25mL	W5057
						100mL	W5058
						500mL	W5059
						1L	W5060
						5L	W5061
						10L	W5062
						20L	W5063

Application: WA-GST FF Comparison Study



Columns: WK-Col GST 4FF - 5 mL vs. 5 mL column from an imported brand
Equilibration Buffer: 50 mM Tris-HCl, 0.2 M NaCl, pH 8.0
Elution Buffer: 50 mM Tris-HCl, 20 mM reduced glutathione, pH 8.0

Thiophilic Affinity Chromatography Resins
Plasmid Series & WH-IgM/IgY

Plasmid Series

The Plasmid series employs 2-mercaptopyridine (2-thiopyridine), a sulfur-containing compound, immobilized on highly cross-linked agarose with high resolution. This thiophilic affinity medium features an optimized ligand density that provides appropriate affinity for supercoiled DNA. The fine particle size enhances the binding capacity for high molecular weight supercoiled plasmids.



WH-IgM/IgY

WH-IgM/IgY utilizes 2-mercaptopyridine immobilized on fine, rigid agarose particles (average particle size: 34 μm). It offers optimal ligand density and suitable affinity for IgM and IgY. The small particle size increases the binding capacity for these large biomolecules. Thiophilic interaction relies on the interaction between electron donors and acceptors, which is enhanced in high-salt conditions and weakened in low-salt environments.

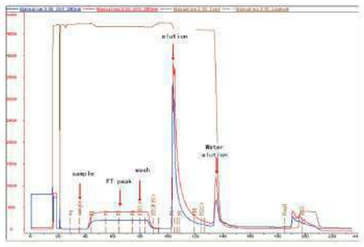
Basic parameters

Resin name	Ligand density (mg/mL)	Recommended flow rate (cm/h)	Dynamic binding capacity (mg/ml)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Plasmid HP	≈ 3.5 (2-mercaptopyridine)	60~150	≥ 2 (superhelical plasmid)	0.3	3~11 (Work) 2~13 (CIP)	25mL	W5064
						100mL	W5065
						500mL	W5066
						1L	W5067
						5L	W5068
						10L	W5069
						20L	W5070
WH-Plasmid Fine	≈ 3.5 (2-mercaptopyridine)	60~250	≥ 2 (superhelical plasmid)	0.5	3~11 (Work) 2~13 (CIP)	25mL	W5071
						100mL	W5072
						500mL	W5073
						1L	W5074
						5L	W5075
						10L	W5076
						20L	W5077

Resin name	Ligand density (mg/mL)	Recommended flow rate (cm/h)	Dynamic binding capacity (mg/mL)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WH-IgM	≈ 2 (2-mercaptopyridine)	60~250	≈ 5 (human IgM)	0.5	3~11 (Work) 2~13 (CIP)	25mL	W5078
						100mL	W5079
						500mL	W5080
						1L	W5081
						5L	W5082
						10L	W5083
						20L	W5084
WH-IgY	≈ 3 (2-mercaptopyridine)	60~250	≈ 20 (human IgY)	0.5	3~11 (Work) 2~13 (CIP)	25mL	W5085
						100mL	W5086
						500mL	W5087
						1L	W5088
						5L	W5089
						10L	W5090
						20L	W5091

Application

Thiophilic affinity purification (removal of open circular DNA (ocDNA) using WH-Plasmid Fine)

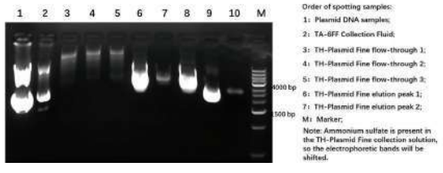


Column: WK-Col Plasmid Fine-5mL

Equilibration Buffer: 2.0 M $(NH_4)_2SO_4$, 100 mM Tris-HCl, 10 mM EDTA, pH 7.5

Elution Buffer: 0.3 M NaCl, 1.7 M $(NH_4)_2SO_4$, 100 mM Tris-HCl, 10 mM EDTA, pH 7.5

Sample: Plasmid DNA purified by WA-6FF



Affinity Chromatography Results: The plasmid DNA peak collected from WA-6FF was subjected to WH-Plasmid Fine, achieving >90% recovery and purity.

Blue Series Dye Affinity Chromatography Resins

Blue Series

The Blue series consists of agarose-based resins functionalized with Cibacron Blue 3GA. These resins are chemi cally and physically stable, with robust ligand retention and long usable lifespans. They bind proteins through specific interactions and also exhibit nonspecific interactions via charge and hydrophobic forces. Widely applied in purification of enzymes (e.g., dehydrogenases, kinases, transferases), serum albumins, interferons, and plasma proteins.

Basic parameters

Resin name	Human serum albumin load (mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Blue FF	≥ 18	60~150	0.3	4~12 (Work) 3~13 (CIP)	25mL	W5092
					100mL	W5093
					500mL	W5094
					1L	W5095
					5L	W5096
					10L	W5097
					20L	W5098
WA-Blue HP	≥ 18	60~120	0.3	4~12 (Work) 3~13 (CIP)	25mL	W5099
					100mL	W5100
					500mL	W5101
					1L	W5102
					5L	W5103
					10L	W5104
					20L	W5105
WH-Blue	≥ 24	60~300	0.5	2~13 (Work) 2~13 (CIP)	25mL	W5106
					100mL	W5107
					500mL	W5108
					1L	W5109
					5L	W5110
					10L	W5111
					20L	W5112
WH-Blue Fine	≥ 24	60~200	0.5	2~13 (Work) 2~13 (CIP)	25mL	W5113
					100mL	W5114
					500mL	W5115
					1L	W5116
					5L	W5117
					10L	W5118
					20L	W5119

Heparin Affinity Chromatography Resins

WA-Heparin FF/HP



This series is composed of heparin covalently coupled to highly cross-linked agarose. It is a group-specific affinity resin widely used for purifying biomolecules, especially enzymes such as antithrombin III, thrombin analogs, human clotting factors IX, XI, VIII, lipoprotein lipase, collagenase, and DNA polymerase. It also binds various cytokines and growth factors including ILs, VEGF, KGF, FGF, and HGF. The resin offers strong chemical and physical stability, long service life, broad compatibility, and scalability.

Basic parameters

Resin name	Ligand Density (mg Heparin/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Heparin FF	≈ 4	60~150	0.3	4~12 (Work) 4~13 (CIP)	25mL	W5120
					100mL	W5121
					500mL	W5122
					1L	W5123
					5L	W5124
					10L	W5125
					20L	W5126
WA-Heparin HP	≈ 10	60~120	0.3	5~10 (Work) 4~13 (CIP)	25mL	W5127
					100mL	W5128
					500mL	W5129
					1L	W5130
					5L	W5137
					10L	W5132
					20L	W5133

Benzamidine Affinity Chromatography Resins

WA-Benzamidine 4FF (LS)/(HS)



WA-Benzamidine 4FF is prepared by coupling p-aminobenzamidine to WA-4FF agarose gel. Benzamidine compounds are broad-spectrum inhibitors of serine proteases such as trypsin, thrombin, urokinase, and kallikreins. This resin is ideal for purifying serine proteases or removing them from biological samples.

Basic parameters

Resin name	Dynamic Binding Capacity (mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Benzamidine 4FF (LS)	≈ 25 (Trypsin)	30~150	0.3	2~8 (Work) 1~9 (CIP)	25mL	W5408
					100mL	W5409
					500mL	W5410
					1L	W5411
					5L	W5412
					10L	W5413
					20L	W5414
WA-Benzamidine 4FF (HS)	≥ 35 (Trypsin)	30~120	0.3	2~8 (Work) 1~9 (CIP)	25mL	W5134
					100mL	W5135
					500mL	W5136
					1L	W5137
					5L	W5138
					10L	W5139
					20L	W5140

Poly-L-lysine Based Endotoxin Removal Affinity Resins

WA-Lysine 4FF

WA-Lysine 4FF is manufactured by covalently coupling poly-L-lysine to WA-4FF agarose. Poly-L-lysine selectively binds bacterial endotoxins under suitable conditions, making this resin effective and non-toxic for use in biopharmaceutical applications requiring endotoxin removal.



Basic parameters

Resin name	Dynamic Binding Capacity (mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Lysine 4FF	5000~10000	30~150	0.3	3~12 (Work) 2~13 (CIP)	25mL	W5141
					100mL	W5142
					500mL	W5143
					1L	W5144
					5L	W5145
					10L	W5146
					20L	W5147

Pre-Activated Affinity Chromatography Resins

WA-CNBr 4B

WA-CNBr 4B

WA-CNBr 4B is a cyanogen bromide-activated agarose gel used for covalently coupling biomolecules containing primary amino groups ($–NH_2$). It is ideal for preparing custom affinity media or immobilized enzymes.



Basic parameters

Resin name	Coupling density (mg/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-CNBr 4B	25~60 (α-pancreatic coagulase proteogen)	< 75	0.01	3~11 (Work) 2~11 (CIP)	25g	W5148
					100g	W5149
					500g	W5150
					1kg	W5151
					5kg	W5152
					10kg	W5153
					25mL	W5154
					100mL	W5155
					500mL	W5156
					1L	W5157
					5L	W5158
					10L	W5159
					20L	W5160
WA-CNBr 4FF	25~60 (α-pancreatic coagulase proteogen)	60~150	0.3	3~11 (Work) 2~11 (CIP)	25g	W5161
					100g	W5162
					500g	W5163
					1kg	W5164
					5kg	W5165
					10kg	W5166
					25mL	W5167
					100mL	W5168
					500mL	W5169
					1L	W5170
					5L	W5171
					10L	W5172
					20L	W5173

Pre-Activated Affinity Chromatography Resins

WH-NHS 3.1 & WA-NHS 4FF

WH-NHS 3.1/WA-NHS 4FF are agarose gels pre-activated with N-hydroxysuccinimide (NHS). The matrices are based on high-rigidity/-fast-flow agarose (WH-HF3.1/WA-4FF) with spacer arms suitable for coupling small molecule ligands.



Features:

- Forms stable amide bonds with proteins;
- High chemical stability;
- Long 10-carbon spacer arm reduces steric hindrance;
- Fast flow rate, suitable for large-scale application;
- Easy to use, avoids toxic reagents;
- High flow rates suitable for large-scale applications

Basic parameters

Resin name	Coupling density (μmol NHS/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WH-NHS 3.1	13-22	60~150	0.5	3~13 (Work) 2~13 (CIP)	25mL	W5415
					100mL	W5416
					500mL	W5417
					1L	W5418
					5L	W5419
					10L	W5420
WA-NHS 4FF	16-23	< 150	0.3	3~13 (Work) 2~13 (CIP)	25g	W5174
					100g	W5175
					500g	W5176
					1kg	W5177
					5kg	W5178
					10kg	W5179
					25mL	W5180
					100mL	W5181
					500mL	W5182
					1L	W5183
					5L	W5184
					10L	W5185
					20L	W5186

Pre-Activated Affinity Chromatography Resins

WA-Epoxy 6B

WA-Epoxy 6B is a 6% agarose-based resin pre-activated with epoxy groups. It can covalently bind with organic molecules containing amino, thiol, or hydroxyl groups (e.g., proteins, peptides, polysaccharides). WA-Epoxy 6B offers convenience, mild coupling conditions, high efficiency, and broad applicability across various functional groups.



Basic parameters

Resin name	Coupling density (μmol NHS/mL)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WA-Epoxy 6B	19~40	< 75	0.02	2~14 (Work) 2~14 (CIP)	25g	W5187
					100g	W5188
					500g	W5189
					1kg	W5190
					5kg	W5191
					10kg	W5192
					25mL	W5193
					100mL	W5194
					500mL	W5195
					1L	W5196
					5L	W5197
					10L	W5198
					20L	W5199

Hydroxyapatite Chromatography Resins

WI-CHA 20A/B 40A/B 80A/B

WI-CHA Series are spherical, porous forms of calcium phosphate (hydroxyapatite) calcined at high temperatures. It is a purely inorganic medium specifically designed for biomolecule purification. It binds biomolecules via multiple mechanisms:

1. Phosphate groups (negatively charged) bind to positively charged biomolecules through ionic interactions.
2. Calcium ions form coordination complexes with electron-donating groups such as carboxyls or imidazole rings.
3. Hydroxyl groups form hydrogen bonds with hydroxyl-containing biomolecules.





Type A hydroxyapatite is calcined at lower temperatures, resulting in smaller pores and higher surface area-ideal for binding smaller biomolecules. Type B is calcined at higher temperatures, producing larger pores-suitable for large biomolecules such as antibodies and nucleic acids. Crystalline structure differences from the calcination process also affect selectivity.

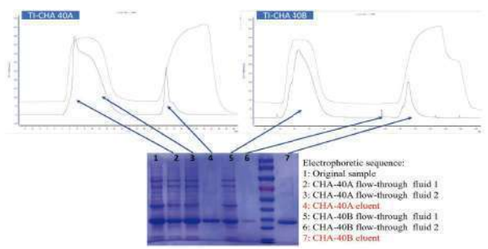
Basic parameters

Resin name	Average particle size (μm)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WI-CHA 20A	20	60~120	10	6.5~12 (Work) 6.5~14 (CIP)	25g	W5337
					100g	W5338
					500g	W5339
					1kg	W5340
					5kg	W5341
					25kg	W5342
WI-CHA 20B	20	60~120	10	6.5~12 (Work) 6.5~14 (CIP)	25g	W5343
					100g	W5344
					500g	W5345
					1kg	W5346
					5kg	W5347
					25kg	W5348

Resin name	Average particle size (μm)	Recommended flow rate (cm/h)	Pressure resistance (MPa)	pH stability	Spec.	P/N
WI-CHA 40A	40	60~300	10	6.5~12 (Work) 6.5~14 (CIP)	25g	W5349
					100g	W5350
					500g	W5351
					1kg	W5352
					5kg	W5353
					10kg	W5354
WI-CHA 40B	40	60~300	10	6.5~12 (Work) 6.5~14 (CIP)	25g	W5355
					100g	W5356
					500g	W5357
					1kg	W5358
					5kg	W5359
					10kg	W5360
WI-CHA 80A	80	100~600	10	6.5~12 (Work) 6.5~14 (CIP)	25g	W5361
					100g	W5362
					500g	W5363
					1kg	W5364
					5kg	W5365
					10kg	W5366
WI-CHA 80B	80	100~600	10	6.5~12 (Work) 6.5~14 (CIP)	25g	W5367
					100g	W5368
					500g	W5369
					1kg	W5370
					5kg	W5371
					10kg	W5372

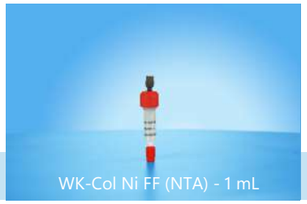
Application Example

WI-CHA 40A and WI-CHA 40B for purification of a recombinant protein



Columns: WK-Col CHA 40A-1mL; WK-Col CHA 40B-1mL
Equilibration Buffer: 20 mM PB, pH 7.5
Elution Buffer: 200 mM PB, pH 7.5
Flow Rate: 0.5 mL/min

Ordering Information of Affinity Pre-packed Columns


WK-Col Ni FF (NTA) - 1 mL


WK-Col Ni FF(NTA)-5mL

Product name	Spec.	P/N
WK-Col Hard Protein A	1x1mL	W6195
	1x5mL	W6196
	5x1mL	W6197
	5x5mL	W6198
WK-Col 16/10 Hard Protein A	1 piece	W6199
WK-Col 26/10 Hard Protein A	1 piece	W6200
WK-Col Protein G 4FF	1x1mL	W6201
	1x5mL	W6202
	5x1mL	W6203
	5x5mL	W6204
WK-Col 16/10 Protein G 4FF	1 piece	W6205
WK-Col 26/10 Protein G 4FF	1 piece	W6206
WK-Col Ni FF (NTA)	1x1mL	W6207
	1x5mL	W6208
	5x1mL	W6209
	5x5mL	W6210
WK-Col 16/10 Ni FF (NTA)	1 piece	W6211
WK-Col 26/10 Ni FF (NTA)	1 piece	W6212
WK-Col Ni HP (NTA)	1x1mL	W6213
	5x1mL	W6214
	1x5mL	W6215
	5x5mL	W6216
WK-Col 4.4 Ni HP (NTA)	1×4.2ml	W6217
	5×4.2ml	W6218

Product name	Spec.	P/N
WK-Col 16/10 Hard IgM	1 piece	W6265
WK-Col 26/10 Hard IgM	1 piece	W6266
WK-Col Hard IgY	1x1mL	W6273
	1x5mL	W6274
	5x1mL	W6275
	5x5mL	W6276
WK-Col 16/10 Hard IgY	1 piece	W6277
WK-Col 26/10 Hard IgY	1 piece	W6278
WK-Col Blue FF	1x1mL	W6279
	1x5mL	W6280
	5x1mL	W6281
	5x5mL	W6282
WK-Col 16/10 Blue FF	1 piece	W6283
WK-Col 26/10 Blue FF	1 piece	W6284
WK-Col Blue HP	1x1mL	W6285
	1x5mL	W6286
	5x1mL	W6287
	5x5mL	W6288
WK-Col 16/10 Blue HP	1 piece	W6289
WK-Col 26/10 Blue HP	1 piece	W6290
WK-Col Hard Blue	1x1mL	W6291
	1x5mL	W6292
	5x1mL	W6293
	5x5mL	W6294

Product name	Spec.	P/N
WK-Col 16/10 Ni HP (NTA)	1 piece	W6219
WK-Col 26/10 Ni HP (NTA)	1 piece	W6220
WK-Col Ni FF(IDA)	1x1mL	W6374
	1x5mL	W6375
	5x1mL	W6376
	5x5mL	W6377
WK-Col 16/10 Ni FF(IDA)	1 piece	W6378
WK-Col 26/10 Ni FF(IDA)	1 piece	W6379
WK-Col Ni HP(IDA)	1x1mL	W6380
	1x5mL	W6381
	5x1mL	W6382
	5x5mL	W6383
WK-Col 4.4 Ni HP(IDA)	1×4.2mL	W6384
	5×4.2mL	W6385
WK-Col 16/10 Ni HP(IDA)	1 piece	W6386
WK-Col 26/10 Ni HP(IDA)	1 piece	W6387
WK-Col Ni FF(TED)	1x1mL	W6389
	1x5mL	W6390
	5x1mL	W6391
	5x5mL	W6392
WK-Col 16/10 Ni FF(TED)	1 piece	W6393
WK-Col 26/10 Ni FF(TED)	1 piece	W6394
WK-Col Ni HP(TED)	1x1mL	W6395
	1x5mL	W6396
	5x1mL	W6397
	5x5mL	W6398
WK-Col 4.4 Ni HP(TED)	1×4.2mL	W6399
	5×4.2mL	W6400
WK-Col 16/10 Ni HP(TED)	1 piece	W6401
WK-Col 26/10 Ni HP(TED)	1 piece	W6402
WK-Col IMAC FF	1x1mL	W6221
	1x5mL	W6222
	5x1mL	W6223
	5x5mL	W6224

Product name	Spec.	P/N
WK-Col 16/10 Hard Blue	1 piece	W6295
WK-Col 26/10 Hard Blue	1 piece	W6296
WK-Col Blue Fine	1x1mL	W6297
	1x5mL	W6298
	5x1mL	W6299
	5x5mL	W6300
WK-Col 16/10 Blue Fine	1 piece	W6301
WK-Col 26/10 Blue Fine	1 piece	W6302
WK-Col Heparin FF	1x1mL	W6303
	1x5mL	W6304
	5x1mL	W6305
	5x5mL	W6306
WK-Col 16/10 Heparin FF	1 piece	W6307
WK-Col 26/10 Heparin FF	1 piece	W6308
WK-Col Heparin HP	1x1mL	W6309
	1x5mL	W6310
	5x1mL	W6311
	5x5mL	W6312
WK-Col 16/10 Heparin HP	1 piece	W6313
WK-Col Benzamidine 4FF	1x1mL	W6315
	1x5mL	W6316
	5x1mL	W6317
	5x5mL	W6318
WK-Col 16/10 Benzamidine 4FF	1 piece	W6319
WK-Col 26/10 Benzamidine 4FF	1 piece	W6320
WK-Col Lysine 4FF	1x1mL	W6321
	1x5mL	W6322
	5x1mL	W6323
	5x5mL	W6324
WK-Col 16/10 Lysine 4FF	1 piece	W6325
WK-Col 26/10 Lysine 4FF	1 piece	W6326
WK-Col CHA 20A	1x1mL	W632011
	1x5mL	W632012
	5x1mL	W632013
	5x5mL	W632014

Product name	Spec.	P/N
WK-Col 16/10 IMAC FF	1 piece	W6225
WK-Col 26/10 IMAC FF	1 piece	W6226
WK-Col Chelating FF	1x1mL	W6227
	1x5mL	W6228
	5x1mL	W6229
	5x5mL	W6230
WK-Col 16/10 Chelating FF	1 piece	W6231
WK-Col 26/10 Chelating FF	1 piece	W6232
WK-Col GST 4FF	1x1mL	W6233
	1x5mL	W6234
	5x1mL	W6235
	5x5mL	W6236
WK-Col 16/10 GST 4FF	1 piece	W6237
WK-Col 26/10 GST 4FF	1 piece	W6238
WK-Col GST 4B	1x1mL	W6239
	1x5mL	W6240
	5x1mL	W6241
	5x5mL	W6242
WK-Col Plasmid HP	1x1mL	W6249
	1x5mL	W6250
	5x1mL	W6251
	5x5mL	W6252
WK-Col 26/10 Plasmid HP	1 piece	W6253
WK-Col 16/10 Plasmid HP	1 piece	W6254
WK-Col Plasmid Fine	1x1mL	W6255
	1x5mL	W6256
	5x1mL	Y6257
	5x5mL	W6258
WK-Col 16/10 Plasmid Fine	1 piece	W6259
WK-Col 26/10 Plasmid Fine	1 piece	W6260
WK-Col Hard IgM	1x1mL	W6261
	1x5mL	W6262
	5x1mL	W6263
	5x5mL	W6264

Product name	Spec.	P/N
WK-Col 16/10 CHA 20A	1 piece	W632015
WK-Col 26/10 CHA 20A	1 piece	W632016
WK-Col CHA 20B	1x1mL	W632021
	1x5mL	W632022
	5x1mL	W632023
	5x5mL	W632024
WK-Col 16/10 CHA 20B	1 piece	W632025
WK-Col 26/10 CHA 20B	1 piece	W632026
WK-Col CHA 40A	1x1mL	W634011
	1x5mL	W634012
	5x1mL	W634013
	5x5mL	W634014
WK-Col 16/10 CHA 40A	1 piece	W634015
WK-Col 26/10 CHA 40A	1 piece	W634016
WK-Col CHA 40B	1x1mL	W634021
	1x5mL	W634022
	5x1mL	W634023
	5x5mL	W634024
WK-Col 16/10 CHA 40B	1 piece	W634025
WK-Col 26/10 CHA 40B	1 piece	W634026
WK-Col CHA 80A	1x1mL	W638011
	1x5mL	W638012
	5x1mL	W638013
	5x5mL	W638014
WK-Col 16/10 CHA 80A	1 piece	W638015
WK-Col 26/10 CHA 80A	1 piece	W638016
WK-Col CHA 80B	1x1mL	W638021
	1x5mL	W638022
	5x1mL	W638023
	5x5mL	W638024
WK-Col 16/10 CHA 80B	1 piece	W638025
WK-Col 26/10 CHA 80B	1 piece	W638026

06 Empty Columns and Accessories


WK-EC 1mL/5mL/4.9mL


WK-EC5/33 (mm/cm) Single Adapter


WK-EC10/33 (mm/cm) Single Adapter


WK-EC26/33 (mm/cm) Single Adapter

Laboratory Grade Manual Chromatography Columns

WK-EC 5/10 Series

WK-EC 5/10 Series are lab-scale empty columns specifically designed for medium- and low-pressure chromatography. They are applicable to biomolecules such as recombinant proteins, antibodies, vaccines, and blood products, as well as small molecules like antibiotics, peptides, synthetic drugs, and natural products. Compatible with agarose, dextran, and polymer-based media, these columns are constructed from high-precision borosilicate glass and PEEK components, offering excellent biocompatibility and chemical resistance for most aqueous solutions.

Pressure ratings: WK-EC 5 – 50 bar; WK-EC 10 – 40 bar.

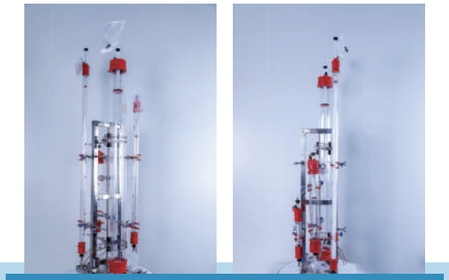
WK-EC 16/26/50 Series

WK-EC 16/26/50 Series are low-pressure columns designed for process development in both biomacromolecule (recombinant proteins, antibodies, vaccines, blood products, etc.) and small molecule (antibiotics, peptides, synthetic drugs, natural products, etc.) applications. They are particularly suitable for natural polysaccharide-based media such as agarose and dextran. All columns in this series have a pressure rating of 5 bar.

Product name	Spec.	P/N
WK-EC 6.6/10 (mm/cm) Dual Adapter	1	E7033
WK-EC 6.6/15 (mm/cm) Dual Adapter	1	E7034
WK-EC 6.6/20 (mm/cm) Dual Adapter	1	E7035
WK-EC 6.6/25 (mm/cm) Dual Adapter	1	E7036
WK-EC 6.6/30 (mm/cm) Dual Adapter	1	E7037
WK-EC 6.6/35 (mm/cm) Dual Adapter	1	E7038
WK-EC 6.6/40 (mm/cm) Dual Adapter	1	E7039
WK-EC 6.6/50 (mm/cm) Dual Adapter	1	E7053
WK-EC 10/10 (mm/cm) Single Adapter	1	E7040
WK-EC 10/15 (mm/cm) Single Adapter	1	E7041
WK-EC 10/20 (mm/cm) Single Adapter	1	E7042
WK-EC 10/25 (mm/cm) Single Adapter	1	E7043
WK-EC 10/30 (mm/cm) Single Adapter	1	E7044
WK-EC 10/40 (mm/cm) Single Adapter	1	E7045
WK-EC 10/50 (mm/cm) Single Adapter	1	E7046
WK-EC 10/15 (mm/cm) Dual Adapter	1	E7047
WK-EC 10/20 (mm/cm) Dual Adapter	1	E7048
WK-EC 10/25 (mm/cm) Dual Adapter	1	E7049
WK-EC 10/30 (mm/cm) Dual Adapter	1	E7050
WK-EC 10/40 (mm/cm) Dual Adapter	1	E7051
WK-EC 10/50 (mm/cm) Dual Adapter	1	E7052
WK-EC 16/20 (mm/cm)	1	E7011
WK-EC 16/30 (mm/cm) Single Adapter	1	E7012
WK-EC 16/30 (mm/cm) Dual Adapter	1	E7055
WK-EC 16/40 (mm/cm) Single Adapter	1	E7013

Product name	Spec.	P/N
WK-EC 16/40 (mm/cm) Dual Adapter	1	E7056
WK-EC 16/70 (mm/cm) Single Adapter	1	E7015
WK-EC 16/70 (mm/cm) Dual Adapter	1	E7057
WK-EC 16/100 (mm/cm) Single Adapter	1	E7017
WK-EC 16/100 (mm/cm) Dual Adapter	1	E7058
WK-EC 26/20 (mm/cm)	1	E7019
WK-EC 26/30 (mm/cm) Single Adapter	1	E7020
WK-EC 26/30 (mm/cm) Dual Adapter	1	E7059
WK-EC 26/40 (mm/cm) Single Adapter	1	E7021
WK-EC 26/40 (mm/cm) Dual Adapter	1	E7060
WK-EC 26/70 (mm/cm) Single Adapter	1	E7023
WK-EC 26/70 (mm/cm) Dual Adapter	1	E7061
WK-EC 26/100 (mm/cm) Single Adapter	1	E7025
WK-EC 26/100 (mm/cm) Dual Adapter	1	E7062
WK-EC 50/20 (mm/cm)	1	E7027
WK-EC 50/30 (mm/cm) Single Adapter	1	E7028
WK-EC 50/30 (mm/cm) Dual Adapter	1	E7063
WK-EC 50/40 (mm/cm) Single Adapter	1	E7029
WK-EC 50/40 (mm/cm) Dual Adapter	1	E7066
WK-EC 50/60 (mm/cm) Single Adapter	1	E7030
WK-EC 50/60 (mm/cm) Dual Adapter	1	E7064
WK-EC 50/70 (mm/cm) Single Adapter	1	E7031
WK-EC 50/70 (mm/cm) Dual Adapter	1	E7067
WK-EC 50/100 (mm/cm) Single Adapter	1	E7032
WK-EC 50/100 (mm/cm) Dual Adapter	1	E7065

Chromatography Column Parts



Fixed empty columns and pre-packed columns on column shelf

Product name	Spec.	P/N
WK-EC 16 adapter	1	E8002
Glass inner tubes for chromatography columns (16/20)	1	E8003
Glass inner tubes for chromatography columns(16/40)	1	E8004
Glass inner tubes for chromatography columns(16/70)	1	E8005
Glass inner tubes for chromatography columns(16/100)	1	E8006
Plastic tubing for chromatography columns (16/20)	1	E8010
Plastic tubing for chromatography columns (16/40)	1	E8011
Plastic tubing for chromatography columns (16/70)	1	E8012
Plastic tubing for chromatography columns (16/100)	1	E8013
WK-EC 26 adapter	1	E8014
Glass inner tubes for chromatography columns (26/20	1	E8015
Glass inner tubes for chromatography columns (26/40	1	E8016
Glass inner tubes for chromatography columns(26/70	1	E8017
Glass inner tubes for chromatography column (26/100	1	E8018
Plastic tubing for chromatography columns(26/20)	1	E8019
Plastic tubing for chromatography columns (26/40)	1	E8020
Plastic tubing for chromatography columns (26/70)	1	E8021
Plastic tubing for chromatography columns (26/100)	1	E8022
WK-EC 50 adapter	1	E8023
Glass inner tubes for chromatography column(50/20)	1	E8024
Glass inner tubes for chromatography column(50/30)	1	E8025
Glass inner tubes for chromatography column(50/60)	1	E8026

Product name	Spec.	P/N
Glass inner tubes for chromatography column(50/100)	1	E8027
Plastic tubing for chromatography columns (50/20)	1	E8028
Plastic tubing for chromatography columns (50/30)	1	E8029
Plastic tubing for chromatography columns (50/60)	1	E8030
Plastic tubing for chromatography columns (50/100)	1	E8031
Column loader acrylic tube 16/26	1	E8032
Column loader acrylic tube 50	1	E8033
Lower column short adapter 16	1	E8036
Lower column short adapter 26	1	E8037
Lower column short adapter 50	1	E8038
Plastic support mesh 16	1	E8039
Plastic support mesh 26	1	E8040
Plastic support mesh 50	1	E8041
Sieve 10 (10 μm)	1	E8042
Sieve 16 (10 μm)	1	E8043
Sieve 26 (10 μm)	1	E8044
Sieve 50 (10 μm)	1	E8045
Column loader top cover seal	1	E9028
16 column head seals	1	E8047
26 column head seals	1	E8048
50 column head seals	1	E8049
50 column screw set	1	E9043

Accessories



Fully equipped chromatography column shelf



5/10/16/26/50 column loaders

Product name	Spec.	P/N
16 column loader	1	E9001
26 column loader	1	E9002
50 column loader	1	E9003
10 column loader	1	E9004
5 column loader	1	E9005
M6 female/TC fitting	2	E9016
Chain clip	1	E9018
Variable direction three-jawed clamp	1	E9019
Lever three-jawed clamp	1	E9020
Fully equipped chromatography column racks	1	E9021
Sample preparation ring 1 mL	1	E9023
Sample preparation ring 2 mL	1	E9024
Sample preparation ring 3 mL	1	E9025
Sample preparation ring 4 mL	1	E9026
Sample preparation ring 5 mL	1	E9027
16 column loader lower washer	1	E9029

Product name	Spec.	P/N
26 column loader lower washer	1	E9030
50 column loader lower washer	1	E9031
1/16 FE-1/16 FE fitting	1	E9032
M6 FE-M6 FE fitting	1	E9033
1/16 FE plug	1	E9034
1/16 MA fitting	1	E9035
PEEK tube 2M (OD 1/16, ID 0.5 mm)	1	E9036
PEEK tube 2M (OD 1/16, ID 0.75 mm)	1	E9037
PEEK tube 2M (OD 1/16, ID 1.0 mm)	1	E9038
5/16" FE-1/16" MA fitting	1	E9039
Column dryer	1	E9040
UV detector (280 nm deuterium lamp)	1	E9041
Data acquisition software	1	E9042
1/16 MA-Luer joints	1	E9044
8 mm column tube connectors	1	E9045